

IL STNGUIDE  
COST IN U.S. DOLLARS

SINCE FILE	TOTAL
ENTRY	SESSION
53.54	182.10

FULL ESTIMATED COST

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE	TOTAL
ENTRY	SESSION
-2.19	-6.57

CA SUBSCRIBER PRICE

FILE 'STNGUIDE' ENTERED AT 19:37:44 ON 01 DEC 2005  
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FILE CONTAINS CURRENT INFORMATION.  
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(FILE 'HOME' ENTERED AT 19:21:12 ON 01 DEC 2005)

FILE 'MEDLINE, BIOTECHDS, EMBASE, BIOSIS, SCISEARCH, CANCERLIT, CAPLUS'  
ENTERED AT 19:21:31 ON 01 DEC 2005

L1 0 S RAYLEIGH-BENARD (5A) CONVENTION CELL  
L2 2617 S RAYLEIGH-BENARD  
L3 7 S L2 AND PCR  
L4 3 DUP REM L3 (4 DUPLICATES REMOVED)  
L5 1 S CONVENTION CELL  
L6 25 S CONVENTION (6A) CELL  
L7 17735 S CONVENTION? (6A) CELL  
L8 654 S L7 AND PCR  
L9 0 S L8 AND (FLUID (3A) LAYER#)  
L10 0 S L8 AND (HEAT? AND COOL?)  
L11 36 S L7 AND (HEAT? AND COOL?)  
L12 0 S L11 AND (FLUID (5A) LAYER#)  
L13 0 S L11 AND (FLUID (5A) (CHAMBER OR CHANNEL OR VESSEL))  
L14 13 S L11 AND (FLUID OR SOLUTION OR LIQUID)  
L15 2 S L2 AND L7

FILE 'STNGUIDE' ENTERED AT 19:31:20 ON 01 DEC 2005

FILE 'MEDLINE, BIOTECHDS, EMBASE, BIOSIS, SCISEARCH, CANCERLIT, CAPLUS'  
ENTERED AT 19:33:16 ON 01 DEC 2005

L16 0 S L2 AND L8  
L17 109 S L2 AND (APPARATUS OR DEVICE OR CHAMBER OR CHANNEL OR VESSEL  
L18 10 S L17 AND (COOL? AND HEAT?)  
L19 8 DUP REM L18 (2 DUPLICATES REMOVED)

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ACCESSION NUMBER: 1991:486692 SCISEARCH  
THE GENUINE ARTICLE: GC350  
TITLE: STOCHASTIC INFLUENCES ON PATTERN-FORMATION IN  
RAYLEIGH-BENARD CONVECTION - RAMPING  
EXPERIMENTS  
AUTHOR: MEYER C W (Reprint); AHLERS G; CANNELL D S  
CORPORATE SOURCE: UNIV CALIF SANTA BARBARA, DEPT PHYS, SANTA BARBARA, CA  
93106 (Reprint); UNIV CALIF SANTA BARBARA, CTR NONLINEAR  
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COUNTRY OF AUTHOR: USA  
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LANGUAGE: English  
REFERENCE COUNT: 80  
ENTRY DATE: Entered STN: 1994  
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\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB We report on computer-enhanced shadowgraph flow-visualization and heat-flux measurements of pattern formation in convective flows in a thin fluid layer of depth  $d$  that is heated from below. Most of the experiments were conducted in a cylindrical container of radius  $r$  and aspect ratio  $\text{GAMMA} = r/d = 10$ . The temperature of the top plate of the container was held constant while the heat current through the fluid was linearly ramped in time, resulting in a temperature difference  $\text{DELTA-T}$  between the bottom and top plates. After initial transients ended, the reduced Rayleigh number  $\text{epsilon} = \text{DELTA-T}/\text{DELTA-T}(c) - 1$ , where  $\text{DELTA-T}(c)$  is the critical temperature difference for the onset of convection, increased linearly with ramp rate  $\beta$  such that  $\text{epsilon}(t) = \beta t$ . When time was scaled by the vertical thermal diffusion time, our ramp rates were in the range 0.01 less-than-or-equal-to  $\beta$  less-than-or-equal-to 0.30. When the sidewalls of the **cell** were made of **conventional** plastic materials, a concentric pattern of convection rolls was always induced by dynamic sidewall forcing. When sidewalls were made of a gel that had virtually the same thermal diffusivity as the fluid, pattern formation occurred independent of cell geometry. In the earliest stages the patterns were then composed of irregularly arranged cells and varied randomly between experimental runs. The same random cellular flow was also observed in samples of square horizontal cross section. The results demonstrate the importance of stochastic effects on pattern formation in this system. However, an explanation of the measured convective heat current in terms of theoretical models requires that the noise source in these models have an intensity that is four orders of magnitude larger than that of thermal noise.

=>

**Rayleigh-Benard** convection at very high Rayleigh numbers close to the He-4 critical point

AUTHOR: Chavanne X; Castaing B; Chabaud B (Reprint); Chilla F; Hebral B

CORPORATE SOURCE: Univ Grenoble 1, Ctr Rech Tres Basses Temperatures, CNRS, BP 166, F-38042 Grenoble 9, France (Reprint); Univ Grenoble 1, Ctr Rech Tres Basses Temperatures, CNRS, F-38042 Grenoble 9, France

COUNTRY OF AUTHOR: France

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PUBLISHER: ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, OXON, ENGLAND.

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\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB In this article we describe an experimental procedure to study **Rayleigh-Benard** convection with He-4 close to its critical point (tabulated as  $T_c = 5.1953$  K in the EIT 90,  $P_c = 2.275$  bar) as the working fluid. The **convention** takes place in a closed cylindrical **cell** (20 cm height and 10 cm inner diameter). The experimental challenge lies in accurate temperature and density measurements. To test our system and our thermometry, an independent measurement of the critical temperature is performed and we found  $5.1939$  K  $\pm 1.0$  mK (EIT 90), Measurements of the Nusselt number versus the Rayleigh number, from the laminar regime ( $Ra$  similar to  $10^3$ ) up to the highest  $Ra$  obtained in a laboratory experiment ( $2 \times 10^{14}$ ) are reported, with  $Nu$  varying from 1 to more than 5000. (C) 1999 Elsevier Science Ltd. All rights reserved.

L15 ANSWER 2 OF 2 SCISEARCH COPYRIGHT (c) 2005 The Thomson Corporation on STN

ACCESSION NUMBER: 1991:486692 SCISEARCH

THE GENUINE ARTICLE: GC350

TITLE: STOCHASTIC INFLUENCES ON PATTERN-FORMATION IN **RAYLEIGH-BENARD** CONVECTION - RAMPING EXPERIMENTS

AUTHOR: MEYER C W (Reprint); AHLERS G; CANNELL D S

CORPORATE SOURCE: UNIV CALIF SANTA BARBARA, DEPT PHYS, SANTA BARBARA, CA 93106 (Reprint); UNIV CALIF SANTA BARBARA, CTR NONLINEAR SCI, SANTA BARBARA, CA 93106

COUNTRY OF AUTHOR: USA

SOURCE: PHYSICAL REVIEW A, (15 AUG 1991) Vol. 44, No. 4, pp. 2514-2537. ISSN: 1050-2947.

PUBLISHER: AMERICAN PHYSICAL SOC, ONE PHYSICS ELLIPSE, COLLEGE PK, MD 20740-3844 USA.

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LANGUAGE: English

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L5: Entry 1 of 1

File: USPT

Jul 16, 2002

DOCUMENT-IDENTIFIER: US 6420595 B1

TITLE: Process control for vinyl acetate manufacture

Drawing Description Text (7):

FIG. 5 is a multi-component trend file containing 50 minutes of run time data for five product tower bottoms solution components;

Drawing Description Text (8):

FIG. 6 is a multi-component trend file containing 150 minutes of run time data for five product tower bottoms solution components;

Drawing Description Text (9):

FIG. 7 is a multi-component trend file containing 180 minutes of run time data for three absorber bottoms solution components;

Drawing Description Text (14):

FIG. 12 is a multi-component trend file containing 127 minutes of run time data for six product tower top solution components;

Drawing Description Text (15):

FIG. 13 is a multi-component trend file containing 86 minutes of run time data for six primary tower bottoms solution components;

Detailed Description Text (7):

In general, the reaction system includes an acid tower 10 with an overhead stream 11 which is heated in reactor feed heater 12. Heated stream 13 is the reactor hydrocarbon feed prior to addition of oxygen 3. After the oxygen addition, the resulting mixed feed stream 15 feeds the reactor 20 and the exothermic heat of reaction is removed by a reactor coolant system 14. The reactor coolant system 14 includes a steam drum 16 from which low pressure steam is generated. Reactor coolant liquid under pressure, stream 21, flows from reactor 20 to steam drum 16 where steam 17 flashes at about 25 psig. The remaining liquid stream 18 plus make-up water (not shown) is returned to the reactor 20 by a coolant pump (not shown). The initial reactor product stream 22 is cooled in the reactor effluent cooler 23 and the resulting cooled reactor product stream 24 feeds directly a vinyl acetate absorber column 30 and indirectly a scrubber column 40 and a carbon dioxide absorber column 50. Crude product stream 32 from the absorber bottom and crude product stream 42 from the scrubber bottom combine as stream 44, which is heated in feed heater 45. The heated feed stream 46 feeds the remainder of the reaction system which generally includes a primary tower 90, a phase separation vessel (decanter) 100, ethyl acetate tower 105, a water stripper column 110, a drying column 120, a lights tower 130 and a product tower 140. Transfer lines, such as pipes, through which process gases and liquids flow, connect columns and vessels. For ease of depiction and discussion, the transfer lines and gas and/or liquid therein are referred to herein as one and the same, using the term "stream." For further ease of depiction and discussion, it should be understood that process liquids are transferred by means of pumps, though such pumps are not depicted in the figures.

Detailed Description Text (102):

A solution 202 representative of the bottom portion of the primary tower 90 was stirred in the one liter flask for about 1.5 hours with a monitoring frequency of one data point per minute. The starting solution was a mixture of acetic acid, water, glycol diacetate and polyvinyl acetate as shown in the first row of Table 17. This starting solution represents the maximum concentrations of water, glycol diacetate and polyvinyl acetate that might be expected in the primary tower 90 bottoms. Several aliquots of vinyl acetate were then added to the flask such that the concentration varied from zero to about 2 molar. This range encompasses the minimum and maximum concentration of vinyl acetate that would be anticipated to be present. The trend lines in FIG. 13 show the incremental increases in vinyl acetate associated with the additions. The corresponding decreases in other components due to dilution can also be seen in FIG. 13 and in Table 17. As a significant portion of the primary tower bottoms solution is used to recycle acetic acid to the reaction section via stream 94, it is important to have an accurate knowledge of the acetic acid/water ratio of the bottoms solution. The data in Table 17 show that an accuracy of  $\pm 0.1$  molar or better can be achieved for both water and acetic acid. Similar or better accuracy can also be achieved for the minor components that may be present in the bottom solution. The combination of data obtainable from the analyses in Example 6 for the top of the primary tower 90 and in this example for the primary tower bottoms would allow close control of primary tower operation to be achieved. For example, the primary tower bottoms temperature could be controlled to maintain the desired acetic acid/water ratio based on the on-line infrared analysis. The ability to effectively quantitatively analyze primary tower 90 top and bottom solutions which represent the two extremes of component concentrations also means that intermediate positions with intermediate solution compositions (and relatively easier analyses) could also be subject to process control. Thus, a compositional profile of the whole tower based on on-line infrared analysis would have implications for optimization of both the purification section and reaction section.

Detailed Description Paragraph Table (11):

TABLE 11 Addition of Vinyl Acetate, Acetic Acid, Hydroquinone and Polyvinyl Acetate to a Product Tower Bottoms Solution: Correlation of On-Line Extended Mid-Infrared Values with Independent Off-Line Analytical Techniques (GC/Weighing) Vinyl Acetate Ethyl Acetate Hydroquinone Acetate Acid Polyvinyl Acetate (Molar) (Molar) (Molar) (Molar) (10.sup.3 Molar) Infrared GC Infrared GC Infrared Weighing Infrared GC Infrared Weighing 0.01 0 10.09 10.15 0.002 0 0.005 0 0.026 0 0.69 0.70 9.49 9.48 0.001 0 0.006 0 0.025 0 1.31 1.33 8.89 8.88 0.002 0 0.002 0 0.084 0 1.93 1.94 8.32 8.30 0 0 0 1.113 0 2.48 2.50 7.79 7.76 0 0 0 0.013 0 3.04 3.04 7.27 7.26 0.001 0 0.001 0 0.023 0 3.51 3.52 6.84 6.82 0.001 0 0.001 0 0.005 0 3.48 3.52 6.77 6.81 0 0 0.022 0.021 0.074 0 3.51 3.51 6.76 6.8 0.001 0 0.045 0.042 0.06 0 3.48 3.50 6.76 6.79 0 0 0.077 0.078 0.047 0 3.47 3.49 6.75 6.78 0.001 0 0.120 0.120 0.006 0 3.46 3.48 6.74 6.77 0.001 0 0.150 0.150 0.065 0 3.47 3.47 6.74 6.77 0.003 0.002 0.16 0.15 0.040 0.007 3.44 3.45 6.76 6.78 0.005 0.005 0.16 0.15 0.074 0 3.43 3.44 6.76 6.79 0.008 0.007 0.15 0.15 0.110 0.011 3.37 3.41 6.79 6.81 0.013 0.012 0.15 0.15 0.119 0.018 3.37 3.38 6.81 6.84 0.015 0.017 0.14 0.15 0.015 0.008 3.34 3.35 6.84 6.86 0.022 0.021 0.14 0.14 0.144 0 3.30 3.32 6.85 6.89 0.027 0.026 0.13 0.14 0.090 0.021 3.29 3.29 6.88 6.91 0.031 0.030 0.13 0.14 0.064 0 3.27 3.26 6.94 6.93 0.035 0.034 0.13 0.14 0.084 0.004 3.22 3.24 6.96 6.97 0.039 0.038 0.13 0.13 0.088 0.024 3.19 3.17 7.01 6.99 0.049 0.046 0.13 0.13 0.381 0.022 3.11 3.10 7.03 7.04 0.082 0.082 0.13 0.12 0.114 0.018 3.09 3.10 7.05 7.05 0.083 0.081 0.13 0.13 0.140 0.059 3.07 3.10 7.08 7.07 0.082 0.081 0.13 0.13 0.224 0.118 3.06 3.10 7.08 7.08 0.084 0.081 0.13 0.13 0.243 0.176 3.06 3.10 7.10 7.09 0.084 0.081 0.13 0.13 0.311 0.234 3.07 3.10 7.09 7.10 0.081 0.081 0.13 0.13 0.322 0.292 3.05 3.10 7.09 7.11 0.082 0.081 0.13 0.13 0.345 0.350 3.04 3.00 7.11 7.10 0.082 0.080 0.13 0.13 0.476 0.427 3.03 3.00 7.13 7.12 0.080 0.080 0.13 0.13 0.529 0.503 3.02 3.00 7.12 7.12 0.082 0.080 0.13 0.13 0.680 0.653 3.02 3.00 7.12 7.13 0.081 0.079 0.13 0.13 0.833 0.800 3.01 3.00 7.15 7.15 0.080 0.078 0.13 0.13 0.954 1.020